

Notice of Allowability

Application No.

09/993,752

Examiner

Robert N. Kang

Applicant(s)

DAVENPORT ET AL.

Art Unit

2622

RNK

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Applicant's Amendment, Filed 11/9/2005.
2. ☒ The allowed claim(s) is/are 1, 6 and 7.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____


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SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

DETAILED ACTION
EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Jose Gutman and Michael Zazzara on 12/20/2005.

2. Claim 1 has been amended as follows:

[line 6]: "... in response to receiving a the signal, the printer ASIC having a bandwidth;"

[lines 10-11]: "transmitting a shorter signal to a the printer ASIC, in response to receiving a the signal..."

3. Claim 6 has been amended as follows:

[line 5-6]: "transmitting a pseudo BD to a the printer ASIC, in response to receiving a the signal;"

[lines 10-11]: "transmitting a second pseudo BD signal to a the printer ASIC, in response to receiving a the signal;"

4. Claim 7 has been amended as follows:

[line 5]: "to a the printer ASIC, in response to receiving a the signal;"

[lines 8-9]: "transmitting a second pseudo BD signal to a the printer ASIC, in response to receiving a the signal;"

5. Page 4 of the specification has been amended as follows:

[line 8]: "...~~constrains~~ constraints from the print engine."

6. Page 7 of the specification has been amended as follows:

[line 11]: "~~Since~~ Because data to the printhead 206 does not run from Beam Detect (BD) to BD..."

[line 14]: "...during those dead times due to timing ~~constrains~~ constraints from the print engine 202."

[line 16]: "...and thus effectively increases the bandwidth of the printer ASIC 204."

7. Page 8 of the specification has been amended as follows:

In a preferred embodiment, a bandwidth booster **210** is placed between the printer ASIC **204** and the print engine **202**. The function of the bandwidth booster **210** is to buffer the print data (shown in FIG. 4 as ASIC VDO **304**) and generate a pseudo BD **302** to the printer ASIC **204** for every real BD **300** from the print engine **202**. The time between each pseudo BD **302** will be same as the real BD **300**. Unlike a real print engine **202**, the bandwidth booster **210** can place much less dead time on the pseudo BD **302**, thus the same amount of data can be transferred over a longer period of time and, effectively, increases the bandwidth of the printer ASIC **204**. The bandwidth booster **210** then transfers the buffered data (shown in FIG. 4 as

Engine VDO 306) to the print engine 202 at a higher speed. This allows a slower printer ASIC 204 to be used with a faster print engine 202.

For example a fast print engine 202 requires the following bandwidth:

$$\text{Data}/(\text{read tBD} - \text{tDT1} - \text{tDT2}) = \text{xMhz.} \quad \underline{\text{Data} / (\text{tBD} - \text{tDT1} - \text{tDT2}) = \text{xMhz.}}$$

The xMhz is over the printer ASIC's 204 limit without the bandwidth booster 210. With the bandwidth booster 210, the tDT1 and tDT2 can be ignored:

$$\text{Data}/\text{pseudo-tBD} = \text{yMhz} \quad \underline{\text{Data} / (\text{tBD} - \text{tDT3} - \text{tDT4}) = \text{yMhz}}, \text{ where yMhz is less than xMhz.}$$

Depending on the speed of the print engine 202, the bandwidth difference between xMhz and yMhz may make the difference between advantageously using a current ASIC 204 or disadvantageously designing a new ASIC.

8. Figure 4 of the disclosure has also been modified as shown in the attached drawing.

Response to Arguments

9. Applicant's arguments, see pages 5-6 of applicant's amendment, filed 11/09/200, with respect to Hanabusa have been fully considered and are persuasive. The rejection of claims 1 and 6 under 35 USC § 102 has been withdrawn.

Statement of Reasons for Allowance

10. Claims 1, 6, and 7 are allowed. These claims will be renumbered as claims 1-3. The following is a statement of reasons for the indication of allowable subject matter:

Examiner finds no prior art in the field of printer hardware which utilizes pseudo Beam Detect signals to trick a printer ASIC into believing there is more transmission time available, thereby effectively increasing the bandwidth of a printer ASIC.

The most relevant prior art Hanabusa (US-PAT 6,824,239) teaches a printer ASIC utilizing various signals primary and secondary signals to control the line speed of the print engine. However, Hanabusa does not disclose the use of a pseudo BD signal nor does Hanabusa's patent teach increasing the printer ASIC bandwidth through the use of this pseudo BD as disclosed by the applicant.

Many prior art references teach buffering a signal through the use of a FIFO queue, thereby increasing effective bandwidth as disclosed by the applicant, as this technique is well known in the art of networking and communications. However, the Examiner has found no existing prior art utilizing this FIFO queue in a bandwidth booster placed between a printer ASIC and the print engine. Furthermore no existing prior art teaches utilizing a bandwidth booster which can operate with an existing printer ASIC through the use of the aforementioned pseudo BD signals.

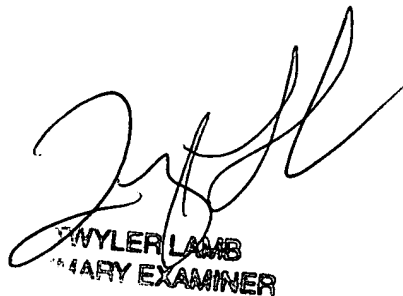
Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee, and to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert N. Kang whose telephone number is (571) 272-0593. The examiner can normally be reached on M-F 8-5.

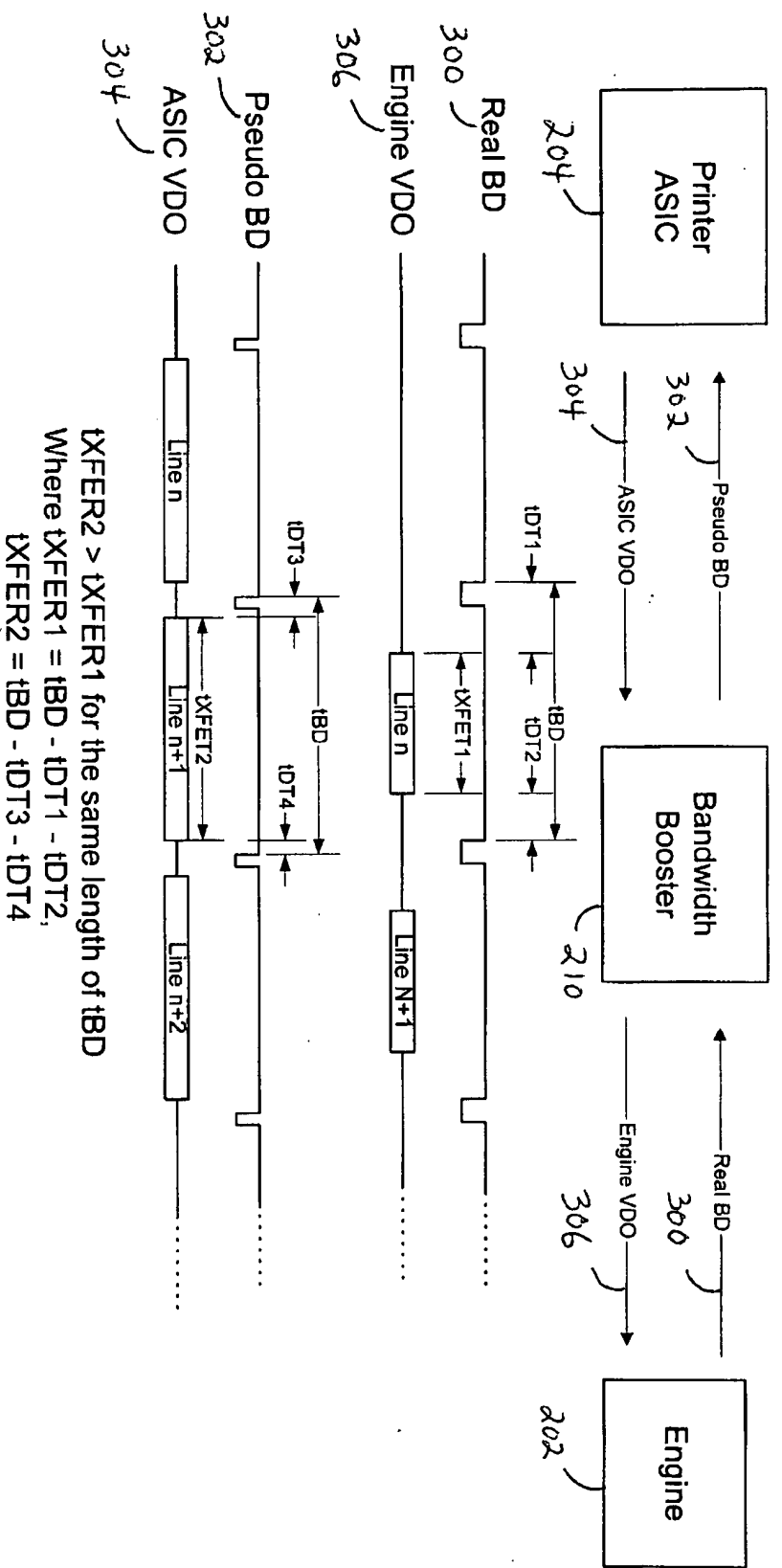
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Coles can be reached on (571)272-7402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RNK



WYLER LAMB
PRIMARY EXAMINER



$t_{XFET2} > t_{XFET1}$ for the same length of t_{BD}
 Where $t_{XFET1} = t_{BD} - t_{DT1} - t_{DT2}$,
 $t_{XFET2} = t_{BD} - t_{DT3} - t_{DT4}$

FIG. 4